

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 89-159

SITE CLEANUP REQUIREMENTS FOR:

M/A-COM, INC.

AND

NEW ENGLAND MUTUAL LIFE INSURANCE COMPANY

999 EAST ARQUES AVENUE SITE

SUNNYVALE, SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board) finds that:

1. Site Location and Description New England Mutual Life Insurance Company owns the site located at 999 East Arques Avenue, Sunnyvale, Santa Clara County, near the intersection of U.S. Highway 101 and the Lawrence Expressway. M/A-COM, Inc., former owner of the site, and New England Mutual Life Insurance Company are hereinafter referred to as the dischargers.
2. Site History Microwave Associates (West), Inc., now known as M/A-COM, Inc., owned and occupied the site from August 1967 to October 1973. During the years 1967 - 1971, Microwave Associates (West) conducted ferrite processing and travelling wave tube fabrication. From 1968 to 1970, microwave semiconductors were fabricated and beginning in 1970, radio frequency equipment was fabricated.

Written manufacturing procedures used by Microwave Associates list cleaning processes (vapor degreasing and ultrasonic cleaning) that used TCE, the primary pollutant found on site. Furthermore, a four-stage clarifier/sump on the exterior of the west end of the primary building on the subject site was found in 1987 to contain a sludge polluted with 87 parts per million (ppm) TCE. Microwave Associates (West) is the only tenant still in operation known to have used this clarifier/sump.

New England Mutual Life Insurance Company obtained title to the subject site in October 1978 and retains current ownership.

In addition to the parties named in this Order, the following are known to have been owners and/or operators of facilities at the property: Ametek, Inc.; Bank of America, N.T. & S.A.;

Melvin Brown; Huggins Laboratories, Inc.; Mullen Equipment Company; Norsk Engineering, Inc.; Poly Mold Tool & Engineering; Realex Development Corporation; Washington Associates; U.G.M., Inc. If additional information comes to light showing that any of these parties not currently named as a discharger caused or permitted any waste to be discharged or deposited on the 999 East Arques site where it entered or could have entered into the waters of the State, the Board will consider adding that party's name to this Order.

3. Hydrogeology The area in the vicinity of the site is underlain by unconsolidated sedimentary deposits of clay, silt, sand, and gravel extending to depths of at least 1,000 feet below the ground surface. These deposits have been subdivided into three general aquifer (water producing) zones designated as the A, B, and C aquifers. The aquifer zones are separated by semi-permeable to relatively impermeable saturated zones (aquitards).

The unconfined, shallow, A aquifer extends from the ground surface to depths of approximately 20 to 25 feet below the ground surface. The semi-confined to confined, intermediate, B aquifer, which generally consists of coarser-grained sedimentary materials than those in the A aquifer, extends from depths of approximately 25 to 45 feet below the ground surface to a depth of approximately 90 feet below the ground surface in the site vicinity. The A and B aquifers are separated by an aquitard ranging in thickness from 5 to 20 feet, or more. Underlying the B aquifer is a thick clay aquitard. The confined, deep, C aquifer exists beneath this aquitard. The A and B aquifers contain very limited ground water supplies with marginal water quality in most places. The C aquifer supplies most of the ground water produced for this region.

The ground water gradient within the A aquifer generally slopes in a north-northeasterly direction in the vicinity of the site. Depth to the water table in this zone ranges from 10 to 13 feet below the ground surface in the general site area. The ground water gradient in the upper portions of the B aquifer slopes in a general northeast direction. In some locations the elevations of the piezometric surface for the upper B aquifer generally correspond to the elevations of the piezometric surface for the A aquifer.

4. Soil Pollution Trichloroethene (TCE) was the predominant volatile organic compound (VOC) reported in soil samples collected from the site. However, other VOCs, including 1,1,1-trichloroethane (TCA), tetrachloroethene (PCE), methyl ethyl ketone (MEK), and toluene were also reported in some of the soil samples. TCE concentrations in vadose zone soil samples ranged from below reporting limits to 12 ppm. In

general, the greatest concentrations of VOCs were reported in soil samples collected from the vicinity of the eastern portion of the main facility. Elevated concentrations of VOCs were also reported in soil samples collected from the vicinity of the external clarifier on the western portion of the main building. Sources for VOCs to the subsurface soils were near the ground surface and some lateral migration of VOCs within the vadose zone has occurred along with the predominant vertical migration. It is indicated that 1,500 cubic yards of soil has been impacted by TCE in concentrations greater than 0.5 ppm.

5. Ground Water Pollution Eight VOCs were found in A aquifer ground water samples, the most predominant of which were TCE, TCA, and cis-1,2-dichloroethene (cis-1,2-DCE). The highest concentrations of VOCs, primarily TCE, up to a concentration of 390,000 parts per billion (ppb), were reported in ground water samples collected from wells located on the eastern portion of the site. Five VOCs were reported in B aquifer ground water samples. The predominant VOCs reported in these samples were TCE and acetone, with the highest concentrations (up to 760,000 ppb TCE and 55,000 ppb acetone) reported in ground water samples collected from a well located on the east side of the main building.
6. Operable Unit For the purposes of this Order and future work at the site, the operable unit consists of the onsite soil and ground water in the A aquifer beneath the site. Remedial measures taken for the operable unit are considered interim remedial actions.
7. Scope of this Order. On August 17, 1988, the Board adopted Order No. 88-133 which prescribed Site Cleanup Requirements to the dischargers and established tasks and time schedules to define the extent of the contaminants and implement interim remedial actions. The intent of this Order is to supersede the requirements of Order No. 88-133 by updating the status of the site and prescribing a time schedule to define the extent of contamination and complete remediation of the operable unit, and to complete final remedial investigations of and evaluate final remedial action alternatives for the site. This Order rescinds Order No. 88-133.
8. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives and beneficial uses for South San Francisco Bay and contiguous surface and ground waters.

9. The existing and potential beneficial uses of the ground water underlying and adjacent to the site include:
 - a. Industrial process water supply
 - b. Industrial service supply
 - c. Municipal and domestic supply
 - d. Agricultural supply.
10. The dischargers have caused or permitted, and threaten to cause or permit, waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.
11. This action is an order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of the Resources Agency Guidelines.
12. Interim containment and cleanup measures need to be implemented to alleviate the threat to the environment posed by the continued migration of pollutants and to provide a substantive technical basis for designing and evaluating the effectiveness of final water cleanup alternatives.
13. The Board has notified the dischargers and interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharge and has provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.
14. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of the pollutants or distortion of portions of the plume under investigation are prohibited.

B. SPECIFICATIONS

1. The storage, handling, treatment or disposal of polluted soil or ground water shall not create a nuisance as defined in Section 13050(m) of the California Water Code.
2. The dischargers shall conduct monitoring activities as needed to define the current local hydrogeologic conditions, and the lateral and vertical extent of ground water pollution. Should monitoring results show evidence of plume migration, additional plume characterization may be required.

C. PROVISIONS

1. The dischargers shall comply with Prohibitions A.1., A.2., and A.3., and Specifications B.1. and B.2. immediately, except as modified in accordance with the following time schedule and tasks:

- a) 1) COMPLETION DATE: October 16, 1989

TASK: SUBMIT OPERABLE UNIT FEASIBILITY STUDY
Submit a technical report acceptable to the Executive Officer, containing a feasibility study evaluating alternative remedial measures to remove pollution from onsite soil and hydraulically contain migration of pollution in the A aquifer, recommended measures necessary to achieve these objectives, and the time schedule necessary to implement the remedial measures.

- 2) COMPLETION DATE: February 4, 1990

TASK: IMPLEMENTATION OF INTERIM REMEDIAL ACTIONS
Submit a technical report acceptable to the Executive Officer documenting implementation of the remedial measures identified in Task 1.a)1).

b. COMPLETION DATE: April 1, 1990

TASK: SUBMIT DRAFT REMEDIAL INVESTIGATION REPORT Submit a technical report acceptable to the Executive Officer defining the complete horizontal and vertical extent of ground water pollution coming from the site.

c. COMPLETION DATE: May 1, 1990

TASK: SUBMIT DRAFT FEASIBILITY STUDY REPORT Submit a technical report acceptable to the Executive Officer containing an evaluation of the installed interim remedial measures, a feasibility study evaluating alternative final remedial measures for the complete site, the recommended measures necessary to achieve final cleanup objectives, and the time schedule necessary to implement the recommended final remedial measures.

d. COMPLETION DATE: September 28, 1990

TASK: SUBMIT FINAL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY REPORT AND PROPOSED REMEDIAL ACTION PLAN Submit a technical report acceptable to the Executive Officer based on the Draft Remedial Investigation and Feasibility Study reports and agency and public comments thereon.

2. All technical reports must be acceptable to the Executive Officer. The submittal of technical reports evaluating proposed interim and final remedial measures will include a projection of the cost, effectiveness, benefits and impact on public health, welfare, and environment of each alternative measure.
3. The Operable Unit Feasibility Study (OU/FS) and the Remedial Investigation and Feasibility Study (RI/FS) shall consider Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300 et seq.); Superfund Amendments and Reauthorization Act of 1986; CERCLA/SARA guidance documents with reference to Remedial Investigations and Feasibility Studies; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California."

4. Any proposal for the discharge of extracted ground water must initially consider the feasibility of reclamation, reuse, or discharge to a publicly owned treatment works (POTW), as specified in Board Resolution No. 88-160. If it can be demonstrated that reclamation, reuse, or discharge to a POTW is technically and economically unfeasible, a proposal for discharge to surface water shall be considered. Such proposal for discharge to surface water shall include the above demonstration and a completed application for an NPDES permit.
5. If the dischargers are delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the dischargers shall promptly notify the Executive Officer. In the event of such delays, the Board may consider modification of the task completion dates established in this Order.
6. The dischargers shall submit to the Board acceptable self-monitoring program reports containing results of work performed according to a program approved by the Executive Officer.
7. The self-monitoring program reports shall also summarize the status of compliance with the Prohibitions, Specifications, and Provisions of this Order and shall be submitted on a quarterly basis, according to the schedule below, commencing with the report for the fourth quarter, due January 31, 1990.

Quarter	1st quarter	2nd quarter	3rd quarter	4th quarter
Period	Jan-March	April-June	July-Sept	Oct-Dec
Due Date	April 30	July 31	October 31	January 31

The quarterly reports shall include:

- a. a summary of work completed since the previous quarterly report,
- b. appropriately scaled and labeled maps showing the location of all monitoring wells, extraction wells, and existing structures,
- c. updated water table and piezometric surface maps for all affected water bearing zones, or alternatively, isoconcentration maps for key contaminants in all affected water bearing zones,
- d. a cumulative tabulation of all well construction data, ground water levels and chemical analysis results for site monitoring wells in the monitoring program approved by the Executive Officer.

- e. a cumulative tabulation of volume of extracted ground water and chemical analysis for all site ground water extraction wells,
 - f. identification of potential problems which will cause or threaten to cause noncompliance with this Order and what actions are being taken or planned to prevent these obstacles from resulting in noncompliance with this Order, and
 - g. in the event of noncompliance with the Provisions and Specifications of this Order, the report shall include written justification for noncompliance and proposed actions to achieve compliance.
8. On a monthly basis, technical reports on compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted monthly to the Board. These reports shall consist of a brief letter report that,
- a. summarizes work completed since submittal of the previous report, and work projected to be completed by the time of the next report,
 - b. identifies any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles, and
 - c. includes, in the event of non-compliance with Provisions of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order.
9. All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, certified engineering geologist or professional engineer.
10. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.
11. The dischargers shall maintain in good working order, and operate, as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

12. Three copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, shall be provided to the Board.
13. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, shall be provided to the following agencies:
 - a. Santa Clara Valley Water District
 - b. Santa Clara County Health Department
 - c. City of Sunnyvale
 - d. State Department of Health Services/TSCD
 - e. Environmental Protection Agency, Region IX.

The Executive Officer may additionally require copies to be provided to a local repository for public use.

14. New England Mutual Life Insurance Company shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:
 - a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
 - d. Sampling of any ground water or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the dischargers.
15. New England Mutual Life Insurance Company shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order.
16. If any hazardous substance is discharged in or on any waters of the State, or discharged and deposited where it is, or probably will be discharged in or on any waters of the State, the dischargers shall report such a discharge to this Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-office hours. A written report shall be filed with the Board within five (5) working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention Control and Countermeasure

Plan (SPCC) in effect, if any, estimated size of affected area, nature of effects, corrective measures that have been taken or planned, and a schedule of these activities, and persons notified.

17. Order No. 88-133 is hereby rescinded.

18. The Board will review this Order periodically and may revise the requirements when necessary.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on September 20, 1989.

A handwritten signature in black ink, appearing to read "Steven Ritchie", is written over a horizontal line.

Steven R. Ritchie
Executive Officer

Attachments: Location Map

